NOTES.

WE regret to announce that Prof. W. F. R. Weldon, F.R.S., Linacre professor of comparative anatomy, Oxford, died suddenly on Friday last, April 13, at the early age of forty-five.

THE University of Berlin has announced the award of a prize of 50*l*. for the best physical or mathematical research presented to the philosophical faculty for the doctor's degree in 1906.

THE eighty-ninth annual meeting of the Swiss Scientific Society will be held this year at St. Gall from July 29 to August 1 under the presidency of Dr. Ambühl. The programme will include an excursion to Mt. Sentis.

ON behalf of the family of the late Prof. Manuelli, of Modena, Herr T. Waitzfelder has presented the Munich Museum with an interesting collection, in which are some original pieces of apparatus used by Galvani and other Italian investigators, together with some pieces of alchemistic apparatus.

THE Schleswig-Holstein Board of Agriculture has elected Dr. Hans Wehnert to succeed Prof. Adolf Emmerling as director of the agricultural chemistry laboratory at Kiel. Dr. Wehnert studied at Brunswick Technical High School and Rostock University, and has had a wide experience as a manufacturer's chemist.

MR. EDGAR R. WAITE has resigned his position as zoologist, Australian Museum, Sydney, consequent upon his appointment to the curatorship of the Canterbury Museum, Christchurch, New Zealand. Before he left England for Sydney in 1892 Mr. Waite was an active secretary of the Yorkshire Naturalists' Union, and also editor of the *Naturalist*.

A CORRESPONDENT of the *Daily Mail*, at Entebbe (Uganda), reports on April 10 that Lieut. Forbes Tulloch, who accompanied the Royal Society's commission sent there to investigate sleeping sickness, has accidentally contracted the disease, and has left for England in charge of Lieut. Gray. The message states that the commission's laboratory has been closed, and all the inoculated monkeys shot to avert further accidents.

A MESSAGE from a correspondent of the *Times* in Athens states that a telegram from Sparta announces the discovery of the famous sanctuary of Artemis Orthia, before whose altar the Spartan youths were scourged when initiated into the privileges of manhood. The site is on the bank of the Eurotas. Votive offerings of ivory and terra-cotta and quantities of small leaden figures have also been found, as well as pottery, which confirms the belief that this was one of the most ancient Spartan shrines.

THE council of the Institution of Naval Architects has nominated Mr. Sidney W. Barnaby to represent that institution on the sectional committee on screw threads and limit gauges of the Engineering Standards Committee in the place of Mr. McFarlane Gray, resigned. The Secretary of State for India has nominated Mr. A. Brereton to represent the India Office on the sectional committee on locomotives in the place of Sir Frederick R. Upcott.

ON Thursday next, April 26, Dr. P. Chalmers Mitchell will deliver the first of two lectures at the Royal Institution on "The Digestive Tract in Birds and Mammals." The Friday evening discourses will be resumed on April 27, when Prof. J. W. Gregory will deliver a discourse on "Ore Deposits and their Distribution in Depth." The discourse on May 4 will be given by the Hon. C. A. Parsons, on "The Steam Turbine on Land and at Sea," and on May 11 by Prof. J. H. Poynting, on "Some Astronomical Consequences of the Pressure of Light."

HERMANN SCHNAUS, one of the most thorough and earnest German writers on photography, died on March 14 from paralysis. Beginning life as a bookseller's assistant, first in Jena and afterwards in Bonn, Frankfurt, and Zürich, Schnaus in 1881 entered the photographic publishing firm of Liesegang, at Dusseldorf. After editing *Photographische Archivs*, the first German periodical devoted to photography, Schnaus founded first *Der Amateur-photograph* (now *Photographische Welt*) and afterwards *Appollo*, and in 1905 took over the editorship of the *Photographische Industrie*, to the pages of which he had assiduously contributed from its inception.

FROM the *Chemiker Zeitung* we learn that the Syndicate of French Sugar Manufacturers, 42 rue du Louvre, Paris, is offering for competition a prize of 100,000 francs for a new application of sugar in the industries, other than the food industry. A condition of the award is that the suggestion shall have been tried in France, and, according to official statistics, have caused an increase in the consumption of sugar in France of at least 100,000 tons in the year. The support of the syndicate is promised in the event of a diminution or the complete abolition of the present sugar tax being necessary for the successful development of the proposed application. Foreigners are not prevented from taking part in the competition.

ON March 17, at Baden-Baden, Prof. Adolf Emmerling, director of the agricultural chemistry laboratory of the Board of Agriculture of the province of Schleswig-Holstein, died in his sixty-fourth year. After graduating at Freiburg in 1865, Prof. Emmerling was for nearly four years an assistant in the chemical laboratory of Freiburg University, and for a further two years under Bunsen at Heidelberg; from thence he went to Kiel to direct the work of what was then the agricultural chemistry laboratory of the agricultural Gewerbeverein, which position he held until his death. His numerous scientific researches were published mainly in the *Berichte* of the German Chemical Society and the "Landwirtschaftlichen-Versuchs-stationen"; these included a number of new experimental methods and descriptions of new apparatus. Prof. Emmerling, who was a Knight of the Order of the Red Eagle, received the title of professor in 1882, and that of Geheimer Regierungsrat in 1900.

SIR THOMAS BROWNE, the author of "Religio Medici," who lived at Norwich in the middle of the seventeenth century, was buried in the church of St. Peter Mancroft during the early part of the last century. It is believed that his skull was abstracted from the grave and is now preserved at the Norfolk and Norwich Hospital. We learn from the *Times* that recently there has been a considerable expression of opinion in Norwich that the skull ought to be returned to the tomb whence it was taken. The hospital governors on Saturday unanimously passed a resolution agreeing to this course, on condition that the tomb shall be opened in the presence of representatives of the hospital with the view of satisfying them that the remains therein are without a skull.

AN earthquake as severe as that of March 17 occurred in South Formosa in the morning of April 14. Kagi was again the town which suffered the most damage. By the disturbance on March 17 1228 persons were killed and

2329 injured, while 5556 houses were totally, and 3383 partially, destroyed. In the present case seven persons were killed and thirty-five injured at Daigo, where 400 buildings were destroyed, while in the Ajensui district the casualties amounted to three killed and fifteen injured, 1191 houses collapsing and 749 being partially wrecked. A Reuter message states that the shock of April 14 was much more severe than that of March 17, and the low death roll, as well as the comparatively small amount of damage done, is to be explained by the fact that the people were more on the alert after their experiences of last month, and that after the havoc caused by the first disturbance there was not much left to destroy.

Arrangements have been made to hold a joint meeting of members of the American Institute of Mining Engineers and of the Iron and Steel Institute in London during the week commencing July 23. The Lord Mayor of London has kindly consented to act as chairman of the London reception committee, and a varied programme of entertainments, visits, and excursions will be provided. Meetings for the reading and discussion of papers will be held on the mornings of July 24, 25, and 26, with visits to works in the afternoons. The Lord Mayor will give an evening reception at the Mansion House on July 24. On July 27 the annual dinner of the institute, to which the American visitors are invited, will be held at the Guildhall. Detailed particulars will be issued when the arrangements are further matured. After the meeting in London, a tour will be arranged for the American visitors to York, Middlesbrough, Newcastle-on-Tyne, Glasgow, and Edinburgh. As an alternative excursion a number of the American visitors have been invited by the local reception committee for the summer meeting of the Institution of Mechanical Engineers to take part in the Cardiff meeting of that society.

As previously announced, the annual meeting of the Iron and Steel Institute will be held on May 10–11. At the first meeting the Bessemer gold medal for 1906 will be presented to Mr. Floris Osmond (Paris), and the awards of the Andrew Carnegie gold medal and research scholarships for 1906 will be announced. Among the papers that are expected to be submitted during the meeting are the following:—Influence of silicon, phosphorus, manganese, and aluminium on chill in cast iron, E. Adamson; influence of manganese on iron, Prof. J. O. Arnold; relation between type of fracture and microstructure of steel test pieces, C. O. Bannister; use of oxygen in removing blast furnace obstructions, C. de Schwarz; volume and temperature changes occurring during the cooling of cast iron, Prof. T. Turner. The following reports on work carried out during the past year by holders of Carnegie research scholarships will be submitted:—Hardness of the constituents of iron and steel, Dr. H. C. Boynton; heat treatment of wire, J. Dixon Brunton; quaternary steels, Dr. L. Guillet; influence of carbon on cast iron, W. H. Hatfield; preparation of carbon-free ferromanganese, E. G. Ll. Roberts and E. A. Wraight; deformation and fracture in iron and steel, W. Rosenhain.

The most important paper in No. 181 of the Proceedings of the American Philosophical Society is one by Miss M. E. Marshall on the anatomy of that aberrant nightjar *Phalaenoptilus nuttali*, the investigation taking into consideration the mutual relationships of the three families usually included in the Caprimulgi.

Among the contents of the *Sitzungsberichte* of the Royal Bohemian Academy of Sciences for 1905 may be mentioned an article by Dr. A. Frič on the reptiles of the Bohemian Cretaceous; Montenegro leeches, by Mr. R. Blanchard; the glands of holothurians, by Mr. K. Thon; and the third part of an account of certain fresh-water amphipod crustaceans, by Prof. F. Vejdovský.

In a paper published in the Proceedings of the Rochester (U.S.A.) Academy of Science (iv., p. 203) Mr. C. L. Sarle concludes that the Silurian fossils described as Arthrophycus and Dædalus, the nature of which has received very various interpretations, are really burrows, Dædalus, at any rate, being probably the work of a sedentary polychætous annelid. The structures form elaborate open spirals of the "Archimedean" type.

The concluding portion of the catalogue of the marine shells of Victoria, by Messrs. Pritchard and Gatcliff, forms the main portion of the contents of part ii. of vol. xviii. of the Proceedings of the Royal Society of Victoria. Mr. F. Chapman describes a new cephalaspid fish from the Silurian of the colony, referred to the genus Thyestes (Auchenaspis), as *T. magnificus*. The species of the genus hitherto known are all small, but the new one rivals in this respect the majority of the representatives of the typical Cephalaspis.

The contents of Scientific Investigations (Fisheries, Ireland), No. 7, 1904 (1906), include a report by Mr. E. W. L. Holt on artificial propagation of Salmonidæ in 1904–5; notes on the spawning season of rainbow trout, by Mr. C. Arens (the translation of a paper written for the International Fish Congress at Vienna last year); records of salmon-marking experiments in Ireland from 1902 to 1905, by Mr. A. B. E. Hillas; and statistical information relating to salmon fisheries.

In a report by Mr. E. D. Sanderson on miscellaneous cotton-insects in Texas, forming Bulletin No. 57 of the Entomological Division of the U.S. Department of Agriculture, attention is directed to the fact that, owing to the ravages of the "boll-weevil," cotton cultivation has entered on a new phase in Texas, and that noxious insects which were formerly ignored have now assumed, in consequence of early and rapid cultivation and reduced acreage, increased importance as factors in the success or otherwise of the crops. Although the investigation is still in its infancy, it is suggested that the remedy for these minor pests will be found in improved methods of cultivation rather than in recourse to poisons.

We have received separate copies of several papers recently published in the *American Journal of Science*, among which are three by Mr. G. R. Wieland on Cretaceous turtles and tortoises, which have been already noticed in our columns. In a fourth the same author discusses the "pro-embryos" of the fossil cycads of the group Bennettiteæ. Since, with the exception of the archegonia of Cycadinocarpus, no developmental stage has hitherto been described in any fossil plant, the discovery is regarded by the author as one of the highest importance. This paper is dated 1904; while others, by Dr. J. Wortman, on remains of Eocene Primates in the Peabody Museum, were originally published during that and the preceding year. Of more recent date is a revision of the New York Helderbergian crinoids, by Miss M. Talbot, and a review of the fauna of the Palæozoic Chazy Limestone of North America, by Mr. P. E. Raymond.

Notes on Bahama snakes, by Mr. J. L. Cole, and the description of a new Bahama sea-spider, or pycnogonid, by Mr. T. Barbour, form two of the articles in the March issue of the *American Naturalist*. Mr. W. Stone contributes notes on Pennsylvanian and other reptiles and amphibians, while Prof. M. A. Wilcox commences an account of the anatomy of the limpet, *Acmaea testudinalis,* a subject to which he has for several years devoted attention. The author states that he has endeavoured to make the communication "serve as an introduction to the study of the fascinating but neglected group of Gastropoda." In the sixth article Dr. A. Hollick and Prof. E. C. Jeffrey discuss the affinities of certain Cretaceous plant remains commonly assigned to the genera Dammara and Brachyphyllum. The so-called Dammara is assigned to a new genus of araucarian under the name of Protodammara, while the shoots and branches referred to Brachyphyllum are likewise of an araucarian nature.

The February number of *Le Bambou* contains an article on the identification of species of Phyllostachys, also cultural hints on some of the Arundinarieæ, and notes on the resistance of bamboos to frost in the south of France.

The list of new garden plants for the year 1905, issued as appendix iii., 1906, to the Kew Bulletin, contains, as usual, a large number of orchids, especially species of Cattleya, Cypripedium, Dendrobium, and Odontoglossum. The African continent continues to furnish a considerable proportion of plants, including species of Aloe, Lissochilus, and Polystachya. Messrs. J. Veitch and Sons have introduced a number of Chinese plants, of which the Primulas have attracted attention, particularly *Primula Cockburniana* that bears large orange-scarlet flowers.

A second paper on the Panama Canal, by the Hon. Theodore P. Shonts, chairman of the Isthmian Canal Commission, is published in the February number of the *National Geographic Magazine.* The experiments with foreign labour, arrangements for transportation facilities, and similar matters are fully described.

The report on the state of the ice in the Arctic seas during 1905 has been issued by the Danish Meteorological Institute. The general conclusion drawn is that great masses of ice were disengaged from the firm ice in the north polar regions at an earlier date than usual, and the ice drifted southward faster and in greater quantities than in a normal year.

The February number of the Bulletin of the American Geographical Society is almost entirely devoted to a report of the second annual meeting of the Association of American Geographers, which was held in New York on December 26 and 27 last, under the presidency of Prof. W. M. Davis. About thirty-three papers were communicated, and abstracts of most of these are to be found in the report.

In an article entitled "Winning the West," in the February *National Geographic Magazine,* Mr. C. J. Blanchard gives an interesting account of the extraordinary progress made by the United States Reclamation Service during the last few years. Of the fifty millions of acres which it is estimated can be reclaimed from the desert by irrigation, ten millions have already been made productive, at a cost of some ninety millions of dollars. This area is occupied by a population of about two millions, and every year it returns a harvest valued at more than one hundred and fifty millions of dollars.

We have received a reprint of a paper, published in the Bulletin of the American Geographical Society, by Mr. Daniel T. Macdougal, on the delta of the Rio Colorado. With the help of a map by Mr. Godfrey Sykes, which accompanies the paper, the author describes the complex hydrography of the region between the international boundary and the present head of the Gulf of California. Some useful notes on the climate and flora are added. The paper gains in interest from the fact that the Salton sink and Imperial Valley immediately to the north of the boundary are likely to be greatly modified in the near future by the work of the U.S. Reclamation Service.

The report of the Meteorological Council for 1904–5 (the last year of the administration of the Meteorological Office by that body), which was recently presented to Parliament, contains an interesting account of the operations of the office since its establishment as a department of the Board of Trade under Admiral (then Captain) FitzRoy in 1854. The amount of up-hill work carried out by Admiral FitzRoy, with Mr. T. H. Babington as scientific assistant, and the very few clerks at his disposal was remarkable. His first care was to issue trustworthy instruments to vessels of the navy and mercantile marine, and to collect observations relating to meteorology over the oceans; but pending the receipt and collation of these observations he quickly converted Maury's numerical wind charts into seasonal charts of graphical wind-stars, and issued them in great numbers to seamen. These were soon supplemented by monthly charts, from observations obtained from British ships, combined with those from Maury's charts. Subsequently he collected and collated synchronous observations for both land and sea, from the study of which he was enabled to commence his system of storm signals and weather forecasts by which his name in this country is best known. After his death, in 1865, the management of the office was placed under a committee of the Royal Society, with an increased grant; this body established the self-recording observatories, and under the able administration of Mr. R. H. Scott, as director, the operations of the office were greatly extended. In 1877, on the recommendation of a committee of inquiry, the Meteorological Committee, the services of the members of which were honorary, was replaced by a paid council, with a further increase in the grant. After the lamented death of Prof. Henry Smith in 1883, General (now Sir Richard) Strachey became chairman; his great administrative power and ability in the direction of the constantly increasing work and usefulness of the office (with Mr. Scott, and more recently Mr. Shaw, as secretary), are too well known to require further comment here. The work of all departments, relating to marine meteorology, weather forecasts, and the discussion of the observatory and other records, attained a high degree of excellence, and compares favourably with that performed by any foreign meteorological organisation.

A new method of exactly standardising thermometers between 0° C. and −4°·0 C. has been devised by Prof. T. W. Richards and Mr. F. G. Jackson; it is described in the Proceedings of the American Academy (vol. xli., No. 21), and consists in observing the temperatures recorded for the freezing point of dilute hydrochloric acid solutions of known concentration. A table is given of the values for the freezing point of solutions of different strengths. The method should be of special service in standardising thermometers used for accurate physical-chemical researches, particularly in measurements of the freezing point of dilute solutions.

In the Proceedings of the American Academy of Arts and Sciences (vol. xli., No. 20) Prof. Theodore W. Richards and Mr. R. C. Wells deal with the possibility of utilising the temperature of transition of sodium bromide dihydrate into the anhydrous salt as a fixed point in accurate thermometry. As the result of their investigations they conclude that when the salt is quite pure the transition of the dihydrate into the anhydrous salt takes place at a temperature of 50°·674 C., but that the exact value of the transition point is slightly modified by the presence of traces of impurity. Considerable difficulty is experienced in preparing pure sodium bromide free from sodium chloride: it cannot be obtained by re-crystallising the ordinary bromide, but must be made from pure bromine and pure sodium carbonate. Details are given of the methods used in purifying these materials, the sodium bromide ultimately obtained giving a value of 23·008 for the atomic weight of sodium; this value agrees closely with that recently found for the atomic weight by the same investigators using a method based on the analysis of sodium chloride.

The variation of the properties of the hydroxyl group of alcohols as the nature and number of the alkyl radicals attached to the carbon atom are varied forms the subject of a suggestive paper by Prof. Louis Henry in No. 12 of the Bulletin of the Royal Academy of Belgium. The observations are of interest both from practical and classificatory standpoints. It is pointed out that as the number of alkyl groups is increased in passing from a primary to a tertiary alcohol, the properties characterising the hydroxyl pass from those associated with the hydroxyl radical of water to those characteristic of the hydroxyl of bases, such as potash. In particular the different behaviour is emphasised of the three classes of alcohols towards the halogen hydrides, towards acetyl chloride, and during esterification by means of hydrogen chloride and a fatty acid. The generalities established can be utilised as a means of predicting the behaviour of the mixed alkyl ethers when subjected to the decomposing action of the halogen acids.

A well-illustrated price-list of sundials and sundial pedestals has just been issued by Messrs. Newton and Co. Many forms of horizontal and vertical dials, and also pocket dials, are described in the catalogue, which should be seen by anyone who desires to possess a timekeeper of this kind as a reminder of the days when hours were marked by shadows on a dial.

A copy of the report for 1905 of the Rugby School Natural History Society has been received. It is to be regretted that "a distinct falling off in the keenness of the sections taken as a whole" during 1905 was, according to the preface, noticed by the officers of the society. It may be hoped that the present year will, by its exceptional exhibition of vigour, retrieve the character of what has been a hard-working society.

The Journal of the Royal Sanitary Institute (vol. xxvii., No. 3) contains the full text of the important series of papers read at the conference on smoke abatement in December, 1905. The list includes the address by Sir W. H. Preece, K.C.B., on factory and trade smoke abatement; and papers on stoking, by Commander W. F. Caborne; on the abatement of smoke from factories, by Dr. S. Rideal; on the artificial production of persistent fog, by the Hon. Rollo Russell; on the destructive effect of smoke in relation to plant life, by Mr. Arthur Rigg; on the work of the Hamburg Smoke Abatement Society, by Mr. J. B. C. Kershaw; on observations on smoke densities, by Mr. J. W. Lovibond; and on the effect of smoke on plant life, by Miss M. Agar.

OUR ASTRONOMICAL COLUMN.

The Continuous Spectrum of the Chromosphere.—An interesting communication dealing with the question of the existence of a continuous spectrum in the radiations emitted by the chromosphere was communicated to the Paris Academy of Sciences by M. Deslandres on March 26.

M. Deslandres made special preparations for the eclipse in August last in order to determine whether the continuous spectrum (*i.e.* the radiations emitted by solid or liquid *particles*) of the chromosphere is brighter, as bright, or less bright than that of the neighbouring corona. Employing coloured screens, which absorbed the gaseous radiations, he photographed the uneclipsed ring of chromosphere and corona directly, and, in order to determine what proportion of the transmitted radiations was due to the light emitted by the metallic prominences, &c., he simultaneously employed two grating cameras which disclosed the presence and intensity of the latter.

Comparing the images photographed through screens with similar ones obtained in the usual manner by Count de la Baume Pluvinel, it was seen that the former exhibited many striking peculiarities in the large group of prominences in the north-east quadrant. On the screen photographs the prominences were much shorter than on the ordinary photographs, whilst their base and a series of nuclei towards the north were much brighter than the other portions, features not noticeable on the ordinary negatives. Spectrograms of the corona secured at Palma by Dr. W. J. S. Lockyer confirmed the results of this comparison.

M. Deslandres concludes that these prominences did emit a continuous spectrum which was more intense than that of the neighbouring parts of the corona, and were far richer in incandescent particles. A programme for the prosecution of this important research in future eclipses accompanies M. Deslandres's communication (*Comptes rendus*, No. 13).

Objective-prism Determinations of Stellar Radial Velocities.—Circular No. 110 of the Harvard College Observatory contains a brief description of some results recently obtained with the objective-prism method of determining radial velocities. In this method an exposure is made in the usual way, then the prism is turned through 180° and a similar exposure made, or the telescope may be reversed and the photographic plate turned through 180°. Stars with known velocities serve as standards for the displacement of the corresponding lines in the two spectra.

A reproduction of a spectrogram of the Pleiades, taken on January 29 with the 11-inch Draper telescope, is given in the Circular. On this plate about a dozen stars could be measured, and the probable error in the resulting velocities would be about ±3·5 km. The scale is 52″·6 = 0·1 cm., and the exposures were thirty-seven and thirty minutes respectively. On another plate, secured on January 29 with two exposures of about twenty minutes each, about 100 stars could be measured, although a number of them, owing to distortion at the edge of the plate, could only be employed to ascertain the corrections necessary.

In No. 2, vol. xxiii., of the *Astrophysical Journal*, Mr. Geo. C. Comstock discusses a similar method for determining radial velocities, but he proposes two similar direct-vision prisms placed in front of the objective. Formulæ for calculating the velocities from the measures obtained accompany Mr. Comstock's paper.

The Observation of Long-period Variables.—In Circular No. 112 of the Harvard College Observatory Prof. Pickering publishes a plea for the organised observations of long-period variable stars, observations which are especially suitable for amateur observers. In order to facilitate this work various catalogues of such stars have already been published by the Harvard observers, and a new one, bringing the results up to date, is now in the printer's hands. When published, copies of this catalogue will be given to all observers who can make use of it.

A number of enlarged copies of Father Hagen's charts of the fainter variables are also being prepared, and will be supplied at cost, or given, to observers qualified to use them. Instructions as to the improved method of making these observations are included in the present Circular.